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Greene, entitled "Studies in the Botany of California and Parts Adjacent."——Dr. Halsted's *Bulletin of the Iowa Agricultural College*, from the Botanical Department, contains many things of interest, from methods of work and study in the class-room and laboratory to scientific descriptions of species.——Dr. Vasey has recently issued a pamphlet of sixty-three pages on the "Grasses of the South." It forms Bulletin No. 3 of the Botanical Division of the Department of Agriculture at Washington. Aside from its high value to the agriculturists of the South, it possesses a good deal of botanical interest.——The weeds of Southwestern Wisconsin have been listed and discussed by L. H. Pammel in a twenty-page pamphlet, which has just appeared.

ZOOLOGY.

Radiolaria.—By far the most important contribution to our knowledge of the Protozoa within recent years is the report on the Radiolaria of the "Challenger" expedition, just published by Professor Ernst Haeckel, of Jena. A summary of these nearly two thousand pages and one hundred and forty quarto plates is impossible. We can but indicate something of their scope. Professor Haeckel now restricts the limits of the Radiolaria more than formerly. As he now defines them they are "Rhizopoda with central capsule and calymma," for, as he says, their most important character is the fact that the unicellular body is always in two main portions, an inner central nucleated capsular and an extra-capsular non-nucleated portion, the calymma, the two being separated by a capsule-membrane. The majority have a skeleton, usually of silica, but frequently of organic substance (acanthin), and this may take the most beautiful shapes imaginable. The present report embraces not only the Radiolaria taken by the "Challenger" collections, but is a complete monograph of all known species, and has employed Professor Haeckel's time for ten years. The classification now adopted varies considerably from that of his monograph "Die Radiolarien" of 1862. It divides the group or class into two sub-classes.

Sub-Class I.—Porulosa. Central capsule primitively a sphere, and retains this homaxon form in the majority of species. The membrane of the central capsule is everywhere perforate, but possesses no larger osculum. The pseudopodia radiate in all directions, and in great numbers, passing through the openings in the capsular membrane. To this sub-class belong two legions,—1, Peripylea, or Spumellaria, with six orders, and, 2, Actipylea, or Acantharia, with four orders.

Sub-Class II.—Osculosa. Central capsule originally monaxon (ovoid or spheroidal), retaining this condition in most species. The membrane of central capsule with a single large osculum at the base of its vertical main axis. Pseudopodia radiating from the sarcode streaming from the osculum. This also contains two legions,—1, Monopylea, or Nassellaria, with six orders, and, 2, Cannopylea, or Phæodaria, with four orders.

The immense amount contained in this work can be readily seen from the fact that these twenty orders are in turn subdivided into eighty-five families, seven hundred and thirty-nine genera, and four thousand three hundred and eighteen species; but large as these numbers are, Professor Haeckel doubts if they include half of the recent species. The ancestral group from which all the others are probably derived is the spherical Actissa, the most ancient stem form of the Spumellaria. The literature of the Radiolaria is not very extensive, only sixty titles being catalogued from 1834 until the present date. In the bibliography is a "Phaulographic Appendix," a division which embraces "absolutely worthless literature," a feature which might well be adopted in other bibliographies. The beautiful plates which illustrate the volume show what a field there is in these minute forms for the artist.

Ctenodrilus parvulus.—Under this name Dr. Robert Scharf describes[1] a new species of Oligochæte worm, probably from some part of the British coast, though the exact locality is unknown. The species differs from the two species (*Ct. pardalis* and *Ct. monostylos*) in its smaller size, having but from seven to ten segments, and a total length of about 4 mm. It has but one kind of setæ, which are not pectinated, and it differs from *monostylos* further in lacking the peculiar tentacle found in that form. Scharf concludes that the number of setæ in a bunch is not a good diagnostic character. There is but a single pair of nephridia, which lie in the head. As in the other species the nervous system lies entirely in the ectoderm, and in some regions it is difficult to say where epidermal cells end and nerve-cells begin. No traces of reproductive organs were found, the only mode of reproduction being that by fission, which took place much as described by Kennel in *Ct. pardalis.* A bud is formed between two segments, and, in contradistinction to the Naidæ, these buds are formed in the same order that the new segments are formed, —*i.e.*, from in front backward. The first three segments never show any signs of budding, nor do the last two or three. The buds appear on the anterior dorsal margin of each segment, the segmentation of the body becomes deeper, and soon the body divides, the resulting portions developing the parts necessary to make them perfect worms. The process occupies about forty-eight hours.

Balanoglossus Larvæ.—Mr. W. F. R. Weldon gives a preliminary account of two Balanoglossus larvæ (*Proc. Roy. Socy.*, No. 253) which he obtained in the Bahamas, and which differ considerably in their later development from those described by Bateson (*vide* AM. NAT.). The earliest stage had but a single transverse groove, but the later stages seem readily homologous with Bateson's form up to the time of the appearance of a pair of rudimentary gills. From this point the majority of the specimens undergo a gradual process of degeneration, accompanied by considerable increase in size. The proboscis itself becomes grooved on either side, each groove being provided with short, broad tentacles, while the circular post-proboscidean groove nearly disappears. Internal changes also occur, involving the disappearance of both notched and gill cavities, and an extensive degeneration occurs in the nervous system. The conclusions drawn are, "that there is fair ground for the belief that the organisms described are Balanoglossus larvæ, which for some cause or other have been unable to develop adult characters, and have therefore varied," a probable cause being the drifting of the larvæ into deep water by the action of currents and winds. If this be true, it follows: 1, that in some cases at least heredity can work only on the application of stimuli afforded by particular surroundings; 2, that some larvæ without stimuli are highly variable; 3, that variations produced by a given change may be uniform and definite in character; and, 4, these changes may produce not the modification of ancestral characters, but a hypertrophy of those which are purely larval.

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[1] Quarterly Jour. Micros. Sci., xxvii., March, 1887.

The Glands in the Foot of Nudibranch Molluscs.—Dr. J. H. List gives the result of his studies of the foot of *Tethys fimbriata* (*Zeit. wiss. Zool.*, xlv.). After a few remarks upon the histological structure of connective tissue, muscles, and epidermis, he gives a detailed account of the glands. He recognizes in the upper surface, 1, unicellular mucous glands; 2, unicellular glands with fat-like contents (phosphorescent in function?); 3, unicellular glands with peculiar, frequently laminated contents; and, 4, unicellular glands with coarsely granular contents. On the under surface occur, besides beaker-cells and Nos. 1, 2, and 4 of the upper surface, polynuclear glands, resembling those described by Leydig as pigment and calcareous glands in the feet of terrestrial gasteropods. As in those cases, these latter glands are connected with the connective-tissue cells. Here, however, they contain neither pigment nor lime.

Fresh-Water Crustacea.—Mention should have been made before of Professor L. M. Underwood's "List of the Described Species of Fresh-Water Crustacea from America, north of Mexico," which appears in the second volume of the *Bulletin of the Illinois State Laboratory of Natural History.* It is more than its name implies, for it includes the Oniscidæ, which are terrestrial, as well. The total number of species enumerated is nominally three hundred and thirteen, but doubtless many of these will be found to be synonymes, while there are some omissions to be expected in the pages. A tolerably complete bibliography completes the article. At a casual glance, however, the following titles are noted as not occurring in the list, and are mentioned here so as to make it more complete. All have references to terrestrial or fresh-water forms in the region embraced in the original paper:

Abbott, C. C., "Notes on the Habits of Certain Crawfish," AM. NAT., vii., 1873.

Cooper, J. G., "Report on the Crustacea," "Pacific R. R. Survey," vol. xii., pt. ii., 1860.

Faxon, W., "On the so-called Dimorphism in the Genus Cambarus," *Am. Jour. Sci.*, January, 1878.

Haldeman, S. S., "Crustacea in Baird's Translation of Hoeck's Iconographic Encyclopædia."

Harford, W. G. W., "Description of a New Genus and Three New Species of Sessile-Eyed Crustacea," *Proc. Cal. Acad.*, vii., 1876.

Hay, O. P., "Description of a New Species of Crangonyx." Printed for the author, June 2, 1878.

Harlan, Richard, "Description of a New Species of the Genus Astacus," *Am. Phil. Trans.*, n. s., i., 1830.

Herrick, C. L., "Habits of Fresh-Water Crustacea," AM. NAT., October, 1882.

Herrick, C. L., "Types of Animal Life, Pt. I., Arthropoda." Minneapolis, 1883.

Ingersoll, Ernst, in "Annual Report U. S. Geol. Geog. Survey of Territories for 1874," pp. 387, 388.

Kingsley, J. S., "Synopsis of North American Species of Alpheus," *Bulletin U. S. Geol. Survey*, vol. iv.

Kingsley, J. S., "Carcinological Notes, V.," *Bulletin Essex Inst.*, xiv. p. 105.

Lockington, W. N., "Thalassinidæa and Astacidea of the Pacific Coast," *Annals and Mag. Nat. Hist.*, October, 1878.

Lamarck, P., "Hist. Nat. Animaux sans Vertèbres."

Packard, A. S., "Structure of the Brain of Sessile-Eyed Crustacea," "Memoirs Nat. Acad. Sci.," iii.

Rathbun, R., "Shrimp and Prawn Fisheries of the U. S.," *Bulletin Fish Commission*, 1882.

Rathbun, R., "Collection of Economic Crustaceans, etc., at Fisheries Exhibition, Washington, 1883."

Ryder, J. A., "Successive Appearance of Chirocephalus and Streptocephalus," AM. NAT., p. 703, 1879.

Stuxberg, A., "Tvenna nya Oniscider," *Ofversigt. Vet. Akad. Forh.*, Stockholm, 1872, No. 9.

Dr. O. E. Imhof, after a careful collection of the microscopic fauna of the Alpine lakes of Europe, states that the great majority of the fresh-water basins up to two thousand metres harbor a pelagic fauna very rich in individuals. Some of the lakes at higher elevations are also well supplied. From seven to sixteen species appear usually in each lake up to seventeen hundred and ninety-six metres. The most widely and generally distributed genera are Daphnia, Cyclops, and Diaptomus.

Tropidonotus clarkii B. G., in Southern Louisiana.—Early in June, 1886, the writer had occasion to collect on the salt marshes at Grand Isle, Louisiana. This island is on the Gulf coast at the entrance of Barataria Bay, about forty miles west of the mouth of the Mississippi. Here Clark's water-snake (*Tropidonotus clarkii*) was not uncommon, as several were seen daily, and one or two were secured for identification.—*A. K. Fisher, M.D., Washington, D. C.*, June 7, 1887.

Spelerpes guttolineatus Holbrook, in the Vicinity of Washington, D. C.—On April 10, 1887, Mr. H. W. Henshaw and the writer spent the greater part of the day collecting in the vicinity of Munson Hill, Va., a locality not more than five or six miles in an air-line from the city of Washington.

The surface of the country is very much broken by numerous hills and valleys. The hills and ridges are covered for the most part with pines, while the valleys support a growth of deciduous trees, many of which are of large size.

In a spring at the edge of one of the principal valleys, we were fortunate enough to capture two specimens of *Spelerpes guttolineatus*. According to Professor Cope, who kindly examined the specimens, this locality is several hundred miles north of the known range of the species.

The following species were also found in the same spring: *Spelerpes bilineatus*, *Spelerpes ruber*, *Plethodon erythronotus*, and *Desmognathus fusca*.—*A. K. Fisher, M.D., Washington, D. C.*, June 7, 1887.

Muhlenberg's Tortoise (Chelopus muhlenbergii Schweigger), at Lake George, N. Y.—At Lake George, during the summer of 1883, frequent excursions were made across a large Sphagnum marsh, located at the head of Dunham's Bay, and covering several hundred acres.

On nearly every trip the shells of one or more Muhlenberg's turtles were found. It is difficult to reach any satisfactory conclusion as to the cause of death of these turtles, as the shells were not mutilated in the least, though the flesh had evidently been eaten by something.

The occurrence of this southern species in this locality is especially interesting when taken in connection with the presence of such birds as the Large-billed Water-thrush (*Seiurus motacilla*) and Dove (*Zenaidura macrura*), and of such southern trees as the Dogwood (*Cornus florida*) and Sour-gum (*Nyssa multiflora*), for it tends to show how decidedly this low valley differs from the immediately adjoining border of the Adirondacks region in being Carolinian in its fauna and flora (as already pointed out by Dr. Merriam, "Mammals of the Adirondacks," pp. 11, 12).—*A. K. Fisher, M.D., Washington, D. C.*, June 7, 1887.

Zoological News.—CŒLENTERATES.—Fewkes has described a new medusa from New Haven, under the name *Nectopilema verrillii.* This jelly-fish belongs to the Pilemidæ, and its nearest relatives are Pilema and Rhopilema, with affinities pointing towards Polyrhiza. It is about eighteen inches in diameter, rich, deep brown in the oval cylinder and frills, the umbrella translucent bluish-white.

CRUSTACEA.—H. L. Osborn begins in the May number of the *Amer. Mo. Micros. Jour.* a series of articles on the histology of the crayfish, the first dealing with the green gland.

At a recent meeting of the Linnæan Society of London, Mr. A. O. Walker gave an account of a large collection of Crustacea obtained at Singapore during the years 1879–1883. Several new species of Decapods are described.

Professor H. L. Osborn's article on the Osphradium of Crepidula, to which reference was recently made, has been reprinted in the *Amer. Mo. Micros. Jour.*, viii., pp. 60–64, with illustrations which render the description more readily followed.

WORMS.—Messrs. Gibson and Chalmers, of Liverpool, have come to the conclusion that the so-called hepatic cells of Lumbricus are digestive glands rather than "vasifactive tissue," as has been suggested.

FISHES.—From the Andes of the United States of Colombia G. A. Boulenger describes three new Siluroid fishes.

C. H. Eigenmann and Jennie E. Honing, in their review of the Chætodontidæ of North America, published in the *Annals and Magazine of the New York Academy of Sciences*, admit three genera—Prognathodes, Chætodon, Pomacanthus—and fourteen species of the family.

REPTILIA AND BATRACHIA.—G. A. Boulenger has recently described a new frog of the genus Megalophrys (*M. feæ*), a single specimen of which was procured east of Bhamò, Burma. The head is enormous, nearly twice as broad as long. There are now four species in the genus.

G. A. Boulenger's synopsis of South African snakes contains fifty species, including six Typhlopidæ, only one Python, twenty-six Coluebridæ, ten Elapidæ, and seven Viperids.

G. A. Boulenger has recently described, in the *Ann. and Mag.*

Nat. Hist., a new Rana, three Bufos, and *Phrynella pulchra*, all from Malacca.

MAMMALS.—According to Dr. J. B. Sutton, animals are not free from certain diseases thought to be referable in man to his erect position. One-fourth of the female monkeys dying in the London Zoological Gardens have displacement of the uterus, and the same disease occurs in the lioness, tapir, Cape hunting-dog, pygmy hog, antelope, etc., and in domesticated mammals. Two cases of inguinal hernia in monkeys are recorded, and the disease is said to be common in horses.—*P. Z. S.*, April, 1886.

Balænoptera borealis, or Rudolphi's Rorqual, the "Sejhval" of the Norwegian whalers, proves to be a sufficiently common species, though scarcely known before 1882. In 1885, most of the whales caught along the Finmark coast were of this species. Its average length is about forty-four feet. It is less robust than *B. rostrata*, and may be recognized in the sea by its high, black dorsal fin, more slender head, and more rounded snout. The color is dark gray-blue, except that the belly is more or less white as far as the genitalia. Both sexes seem to attain about the same size; if there is any difference it is in favor of the female. The flippers are slender and pointed, and relatively shorter than in any other species. A new species of Echinorhynchus (*E. ruber*) usually infests the intestines in great numbers, the copepod (*Balænopterus unisetus*) occasionally infests the baleen-plates, and a true ecto-parasite (undescribed) is also occasional. The stomachs of the specimens examined were filled with the remains of the copepod *Colarius finmarchicus.*

The species of Capra, according to Mr. P. L. Sclater, are confined to the following localities: *C. pyrenaica*, to the Pyrenees, Central Spain, and the higher ranges of Andalusia and Portugal; *C. ibex* (the Steinbok), to the Alps of Switzerland, Savoy, and the Tyrol; *C. ægagrus* (the Wild Goat), to Crete and some of the Cyclades in Europe, and through the mountains of Asia Minor and Persia to Sind and Baluchistan; *C. pallasi*, to the Caucasus; *C. sinaitica*, to the mountains of Upper Egypt, the Sinaitic peninsula, and Palestine; *C. walie*, to Abyssinia; *C. sibirica*, to the Altai and the Himalayas; *C. falconeri* (the Markhoor), from the Pirpanjal range, south of Cashmere, into Afghanistan and Gilgit on one side, and the Sulemani range on the other; *C. jemlandica* (the Tahr), to the Himalayas, from Cashmere to Bhotan; and *C. hylocrius*, to the Neilgherries, Anamallays, and other ranges of Southern India.

EMBRYOLOGY.[1]

The Development of Spiders.—The Arachnids are receiving considerable attention recently at the hands of embryologists.

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[1] Edited by Prof. JOHN A. RYDER, Biological Department, University of Pennsylvania, Philadelphia.